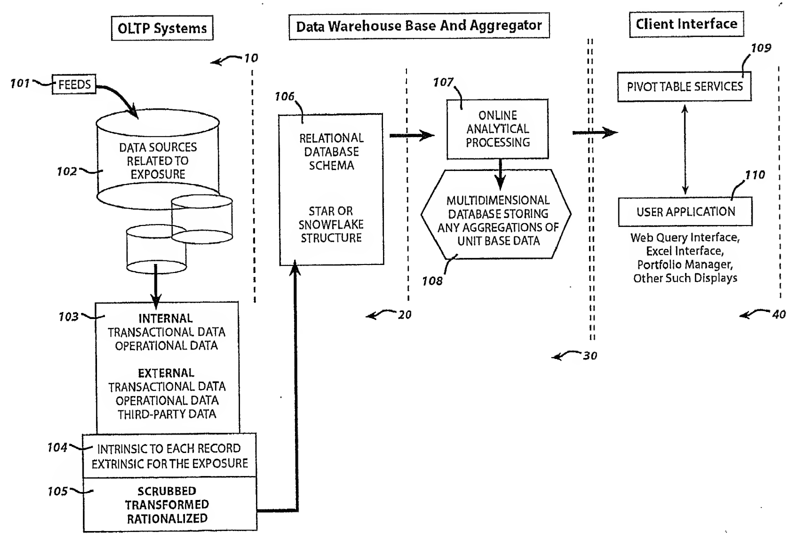
Figure 1



OLTP Systems
Data Warehouse Base And Aggregator
Client Interface
10
20
30
40
101
FEEDS
102
DATA SOURCES RELATED TO EXPOSURE
103
INTERNAL
TRANSACTIONAL DATA
OPERATIONAL DATA
EXTERNAL
TRANSACTIONAL DATA
OPERATIONAL DATA
THIRD-PARTY DATA
104
INTRINSIC TO EACH RECORD
EXTRINSIC FOR THE EXPOSURE
105
SCRUBBED
TRANSFORMED
RATIONALIZED
106
RELATIONAL DATABASE SCHEMA
STAR OR SNOWFLAKE STRUCTURE
107
ONLINE ANALYTICAL PROCESSING
108
MULTIDIMENSIONAL DATABASE STORING ANY AGGREGATIONS OF UNIT BASE DATA
109
PIVOT TABLE SERVICES
110
USER APPLICATION
Web Query Interface,
Excel Interface,
Portfolio Manager,
Other Such Displays

Figure 2a

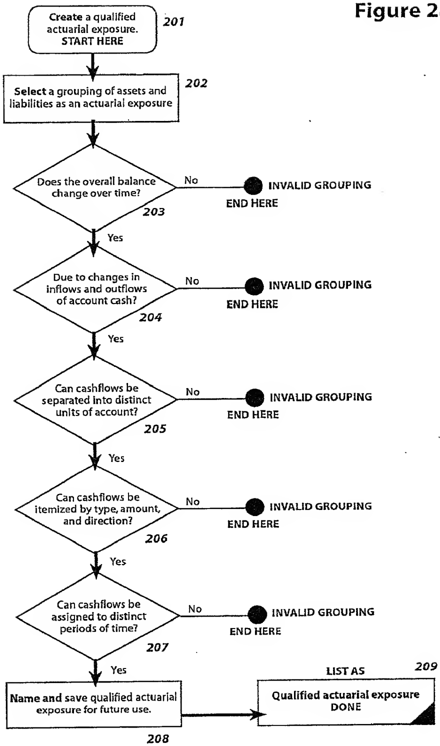
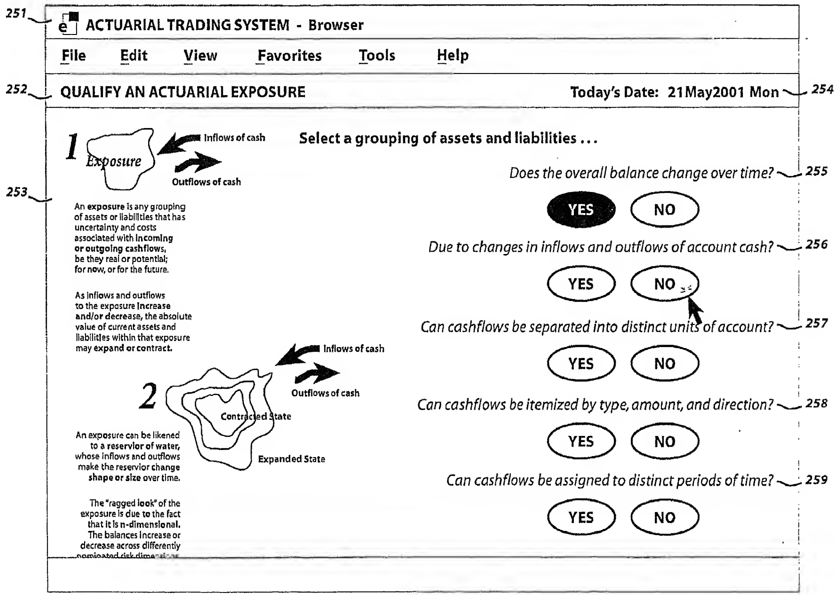

Create a qualified actuarial exposure. START HERE
201
Select a grouping of assets and liabilities as an actuarial exposure
202
Does the overall balance change over time?
203
No
INVALID GROUPING
END HERE
Yes
Due to changes in inflows and outflows of account cash?
204
No
INVALID GROUPING
END HERE
Yes
Can cashflows be separated into distinct units of account?
205
No
INVALID GROUPING
END HERE
Yes
Can cashflows be itemized by type, amount, and direction?
206
No
INVALID GROUPING
END HERE
Yes
Can cashflows be assigned to distinct periods of time?
207
No
INVALID GROUPING
END HERE
Yes
Name and save qualified actuarial exposure for future use.
208
LIST AS
209
Qualified actuarial exposure DONE

Figure 2b



251
ACTUARIAL TRADING SYSTEM - Browser
File
Edit
View
Favorites
Tools
Help
252
QUALIFY AN ACTUARIAL EXPOSURE
Today's Date: 21May2001 Mon
254
253
1
Exposure
Inflows of cash
Outflows of cash
An exposure is any grouping of assets or liabilities that has uncertainty and costs associated with incoming or outgoing cashflows, be they real or potential; for now, or for the future.
As inflows and outflows to the exposure increase and/or decrease, the absolute value of current assets and liabilities within that exposure may expand or contract.
2
Inflows of cash
Outflows of cash
Contracted State
Expanded State
An exposure can be likened to a reservior of water, whose inflows and outflows make the reservior change shape or size over time.
The "ragged look" of the exposure is due to the fact that it is n-dimensional. The balances increase or decrease across differently
Select a grouping of assets and liabilities ...
Does the overall balance change over time?
255
YES
NO
Due to changes in inflows and outflows of account cash?
256
YES
NO
Can cashflows be separated into distinct units of account?
257
YES
NO
Can cashflows be itemized by type, amount, and direction?
258
YES
NO
Can cashflows be assigned to distinct periods of time?
259
YES
NO

Figure 3a

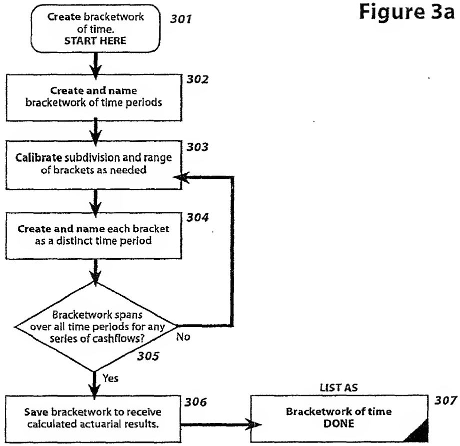

Create bracketwork of time. START HERE
301
Create and name bracketwork of time periods
302
Calibrate subdivision and range of brackets as needed
303
Create and name each bracket as a distinct time period
304
Bracketwork spans over all time periods for any series of cashflows?
305
No
Yes
Save bracketwork to receive calculated actuarial results.
306
LIST AS
Bracketwork of time DONE
307

Figure 3b

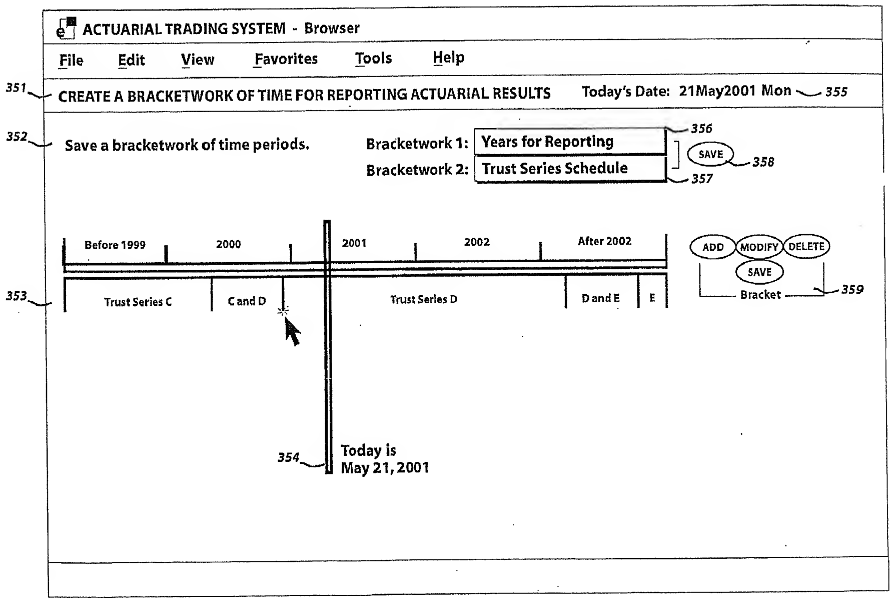

ACTUARIAL TRADING SYSTEM - Browser
File
Edit
View
Favorites
Tools
Help
351
CREATE A BRACKETWORK OF TIME FOR REPORTING ACTUARIAL RESULTS
Today's Date: 21May2001 Mon
355
352
Save a bracketwork of time periods.
Bracketwork 1:
Years for Reporting
356
Bracketwork 2:
Trust Series Schedule
357
SAVE
358
Before 1999
2000
2001
2002
After 2002
353
Trust Series C
C and D
Trust Series D
D and E
E
ADD
MODIFY
DELETE
SAVE
Bracket
359
354
Today is
May 21, 2001

Figure 4a

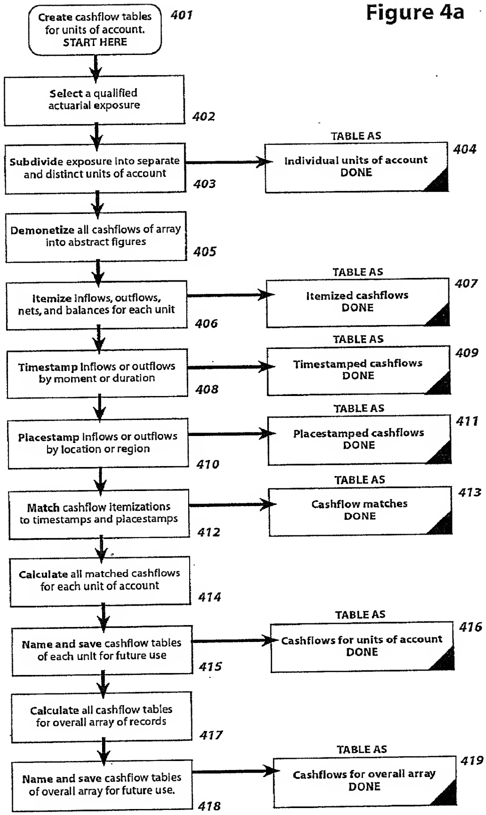
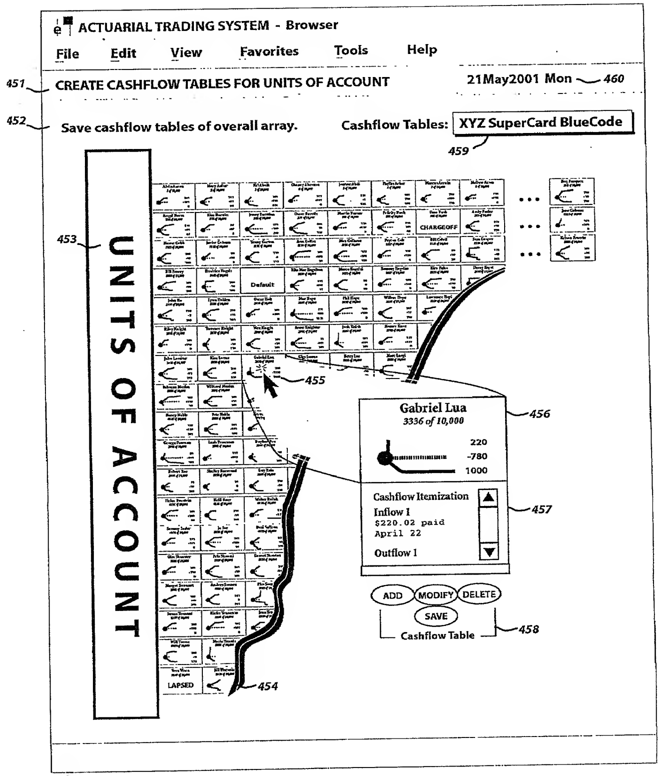

Create cashflow tables for units of account. START HERE
401
Select a qualified actuarial exposure
402
Subdivide exposure into separate and distinct units of account
403
TABLE AS
Individual units of account DONE
404
Demonetize all cashflows of array into abstract figures
405
Itemize inflows, outflows, nets, and balances for each unit
406
TABLE AS
Itemized cashflows DONE
407
Timestamp inflows or outflows by moment or duration
408
TABLE AS
Timestamped cashflows DONE
409
Placestamp inflows or outflows by location or region
410
TABLE AS
Placestamped cashflows DONE
411
Match cashflow itemizations to timestamps and placestamps
412
TABLE AS
Cashflow matches DONE
413
Calculate all matched cashflows for each unit of account
414
Name and save cashflow tables of each unit for future use
415
TABLE AS
Cashflows for units of account DONE
416
Calculate all cashflow tables for overall array of records
417
Name and save cashflow tables of overall array for future use.
418
TABLE AS
Cashflows for overall array DONE
419

Figure 4b



ACTUARIAL TRADING SYSTEM - Browser
File Edit View Favorites Tools Help
451
CREATE CASHFLOW TABLES FOR UNITS OF ACCOUNT
21May2001 Mon
460
452
Save cashflow tables of overall array.
Cashflow Tables:
XYZ SuperCard BlueCode
459
453
UNITS OF ACCOUNT
CHARGEOFF
Default
LAPSED
455
454
Gabriel Lua
3336 of 10,000
220
-780
1000
456
Cashflow Itemization
Inflow I
$220.02 paid
April 22
Outflow I
457
ADD
MODIFY
DELETE
SAVE
Cashflow Table
458

Figure 5a

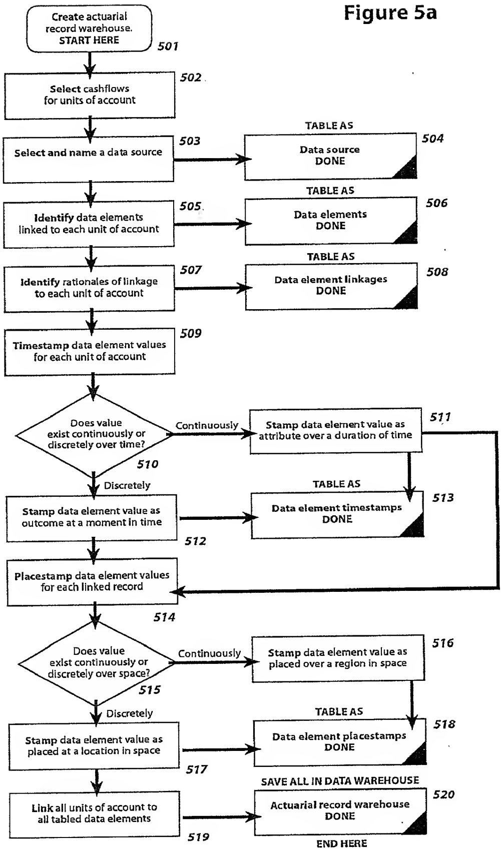
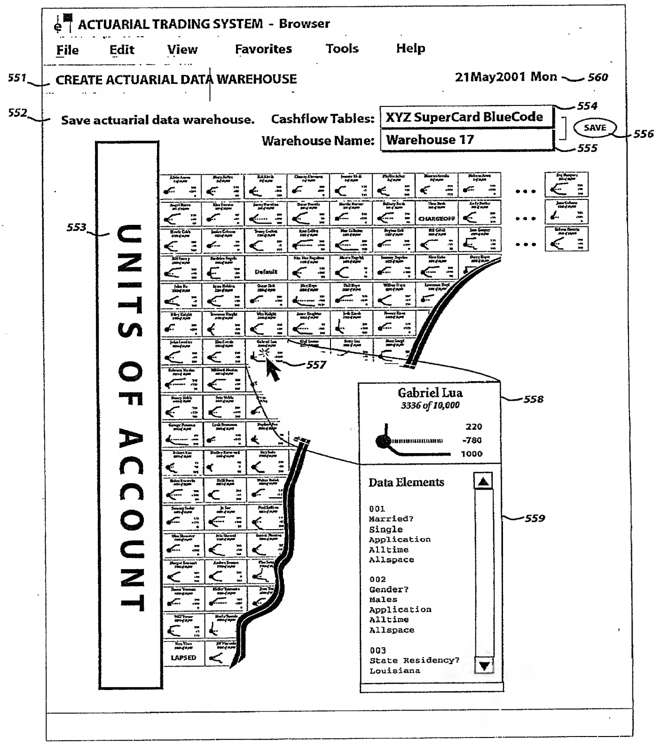
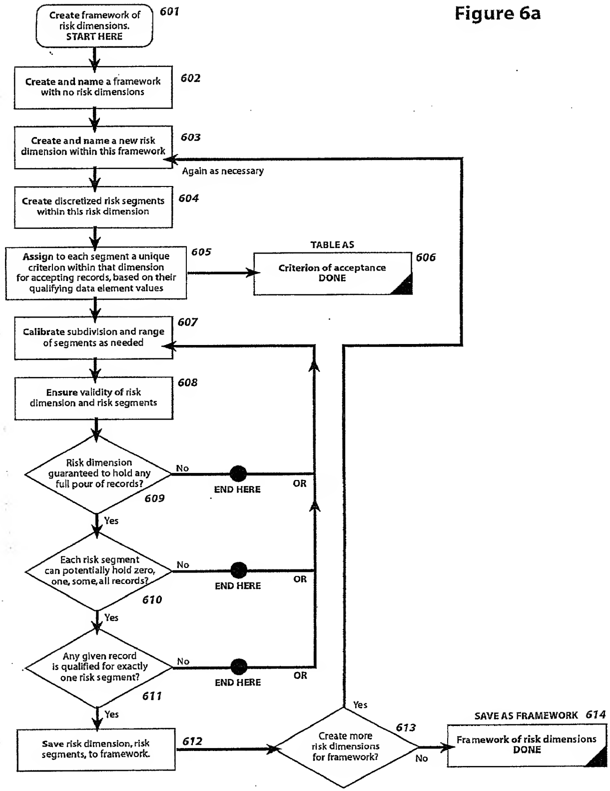

Create actuarial record warehouse. START HERE
501
Select cashflows for units of account
502
Select and name a data source
503
TABLE AS
Data source DONE
504
Identify data elements linked to each unit of account
505
TABLE AS
Data elements DONE
506
Identify rationales of linkage to each unit of account
507
TABLE AS
Data element linkages DONE
508
Timestamp data element values for each unit of account
509
Does value exist continuously or discretely over time?
510
Continuously
Stamp data element value as attribute over a duration of time
511
Discretely
Stamp data element value as outcome at a moment in time
512
TABLE AS
Data element timestamps DONE
513
Placestamp data element values for each linked record
514
Does value exist continuously or discretely over space?
515
Continuously
Stamp data element value as placed over a region in space
516
Discretely
Stamp data element value as placed at a location in space
517
TABLE AS
Data element placestamps DONE
518
Link all units of account to all tabled data elements
519
SAVE ALL IN DATA WAREHOUSE
Actuarial record warehouse DONE
520
END HERE

Figure 5b



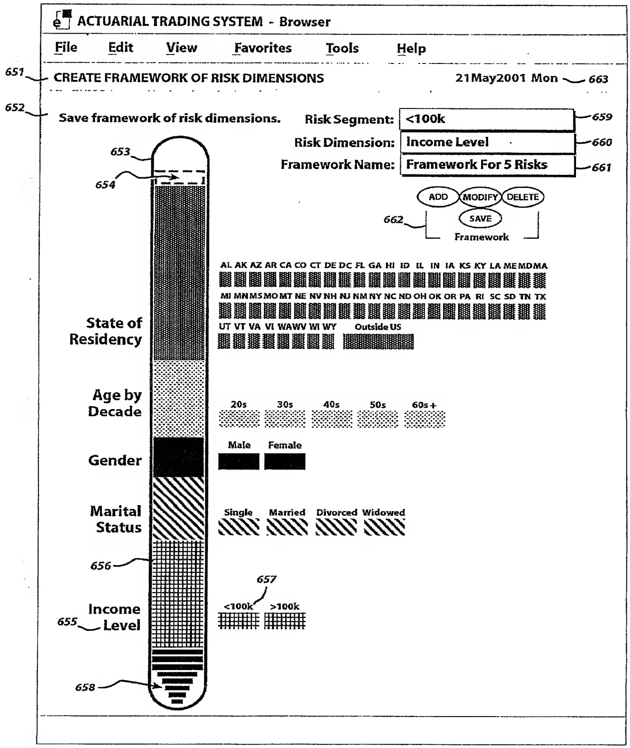
ACTUARIAL TRADING SYSTEM - Browser
File
Edit
View
Favorites
Tools
Help
551
CREATE ACTUARIAL DATA WAREHOUSE
21May2001 Mon
560
552
Save actuarial data warehouse.
Cashflow Tables:
XYZ SuperCard BlueCode
554
Warehouse Name:
Warehouse 17
555
SAVE
556
553
UNITS OF ACCOUNT
CHARGEOFF
Default
LAPSED
557
Gabriel Lua
3336 of 10,000
220
-780
1000
558
Data Elements
001
Married?
Single
Application
Alltime
Allspace
002
Gender?
Males
Application
Alltime
Allspace
003
State Residency?
Louisiana
559



Create framework of risk dimensions. START HERE
601
Create and name a framework with no risk dimensions
602
Create and name a new risk dimension within this framework
603
Again as necessary
Create discretized risk segments within this risk dimension
604
Assign to each segment a unique criterion within that dimension for accepting records, based on their qualifying data element values
605
TABLE AS
Criterion of acceptance DONE
606
Calibrate subdivision and range of segments as needed
607
Ensure validity of risk dimension and risk segments
608
Risk dimension guaranteed to hold any full pour of records?
609
No
END HERE
OR
Yes
Each risk segment can potentially hold zero, one, some, all records?
610
No
END HERE
OR
Yes
Any given record is qualified for exactly one risk segment?
611
No
END HERE
OR
Yes
Save risk dimension, risk segments, to framework.
612
Create more risk dimensions for framework?
613
Yes
No
SAVE AS FRAMEWORK 614
Framework of risk dimensions DONE

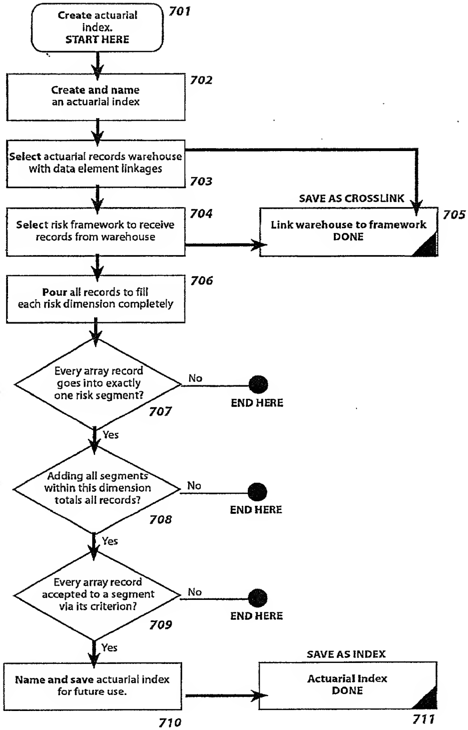
Figure 6a

Figure 6b



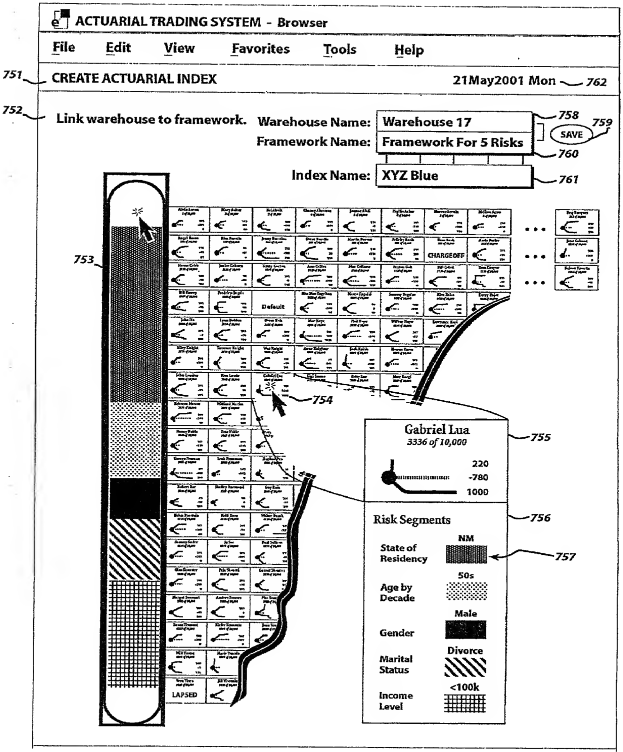
ACTUARIAL TRADING SYSTEM - Browser
File
Edit
View
Favorites
Tools
Help
651
CREATE FRAMEWORK OF RISK DIMENSIONS
21May2001 Mon
663
652
Save framework of risk dimensions.
Risk Segment:
<100k
659
Risk Dimension:
Income Level
660
Framework Name:
Framework For 5 Risks
661
653
654
ADD
MODIFY
DELETE
SAVE
662
Framework
AL AK AZ AR CA CO CT DE DC FL GA HI ID IL IN IA KS KY LA ME MD MA
MI MN MS MO MT NE NV NH NJ NM NY NC ND OH OK OR PA RI SC SD TN TX
UT VT VA VI WA WV WI WY
Outside US
State of Residency
Age by Decade
20s
30s
40s
50s
60s +
Gender
Male
Female
Marital Status
Single
Married
Divorced
Widowed
656
657
Income Level
655
<100k
>100k
658

Figure 7a



Create actuarial index. START HERE
701
Create and name an actuarial index
702
Select actuarial records warehouse with data element linkages
703
SAVE AS CROSSLINK
Select risk framework to receive records from warehouse
704
Link warehouse to framework DONE
705
Pour all records to fill each risk dimension completely
706
Every array record goes into exactly one risk segment?
707
No
END HERE
Yes
Adding all segments within this dimension totals all records?
708
No
END HERE
Yes
Every array record accepted to a segment via its criterion?
709
No
END HERE
Yes
SAVE AS INDEX
Name and save actuarial index for future use.
710
Actuarial Index DONE
711

Figure 7b



ACTUARIAL TRADING SYSTEM - Browser
File
Edit
View
Favorites
Tools
Help
751
CREATE ACTUARIAL INDEX
21May2001 Mon
762
752
Link warehouse to framework.
Warehouse Name:
Warehouse 17
758
759
SAVE
Framework Name:
Framework For 5 Risks
760
Index Name:
XYZ Blue
761
753
CHARGEOFF
Default
754
LAPSED
Gabriel Lua
3336 of 10,000
220
-780
1000
755
Risk Segments
756
State of Residency
NM
757
Age by Decade
50s
Gender
Male
Marital Status
Divorce
Income Level
<100k

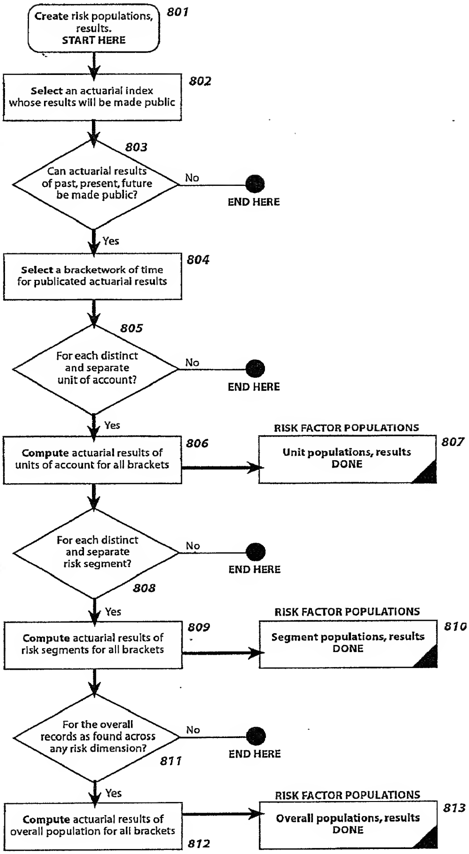
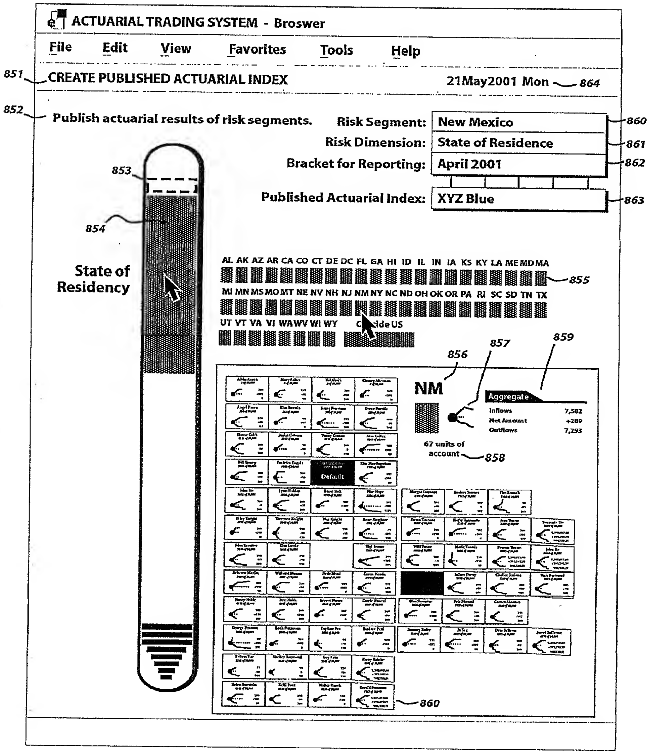
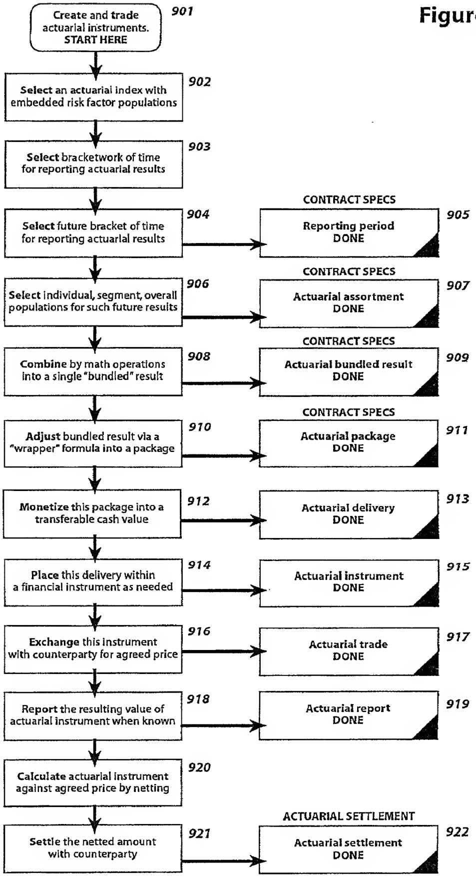

Create risk populations, results. START HERE
801
Select an actuarial index whose results will be made public
802
Can actuarial results of past, present, future be made public?
803
No
END HERE
Yes
Select a bracketwork of time for publicated actuarial results
804
For each distinct and separate unit of account?
805
No
END HERE
Yes
Compute actuarial results of units of account for all brackets
806
RISK FACTOR POPULATIONS
Unit populations, results DONE
807
For each distinct and separate risk segment?
808
No
END HERE
Yes
Compute actuarial results of risk segments for all brackets
809
RISK FACTOR POPULATIONS
Segment populations, results DONE
810
For the overall records as found across any risk dimension?
811
No
END HERE
Yes
Compute actuarial results of overall population for all brackets
812
RISK FACTOR POPULATIONS
Overall populations, results DONE
813

Figure 8a

Figure 8b



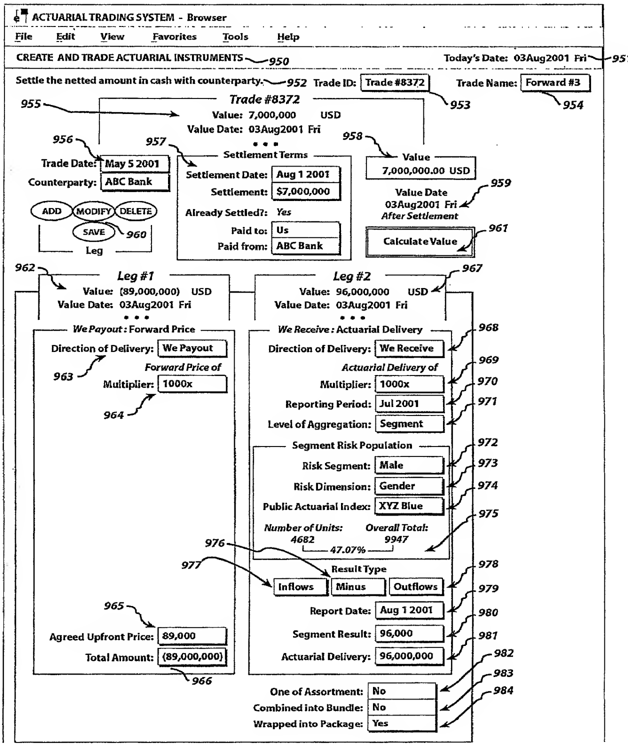
ACTUARIAL TRADING SYSTEM - Broswer
File Edit View Favorites Tools Help
851
CREATE PUBLISHED ACTUARIAL INDEX
21May2001 Mon
864
852
Publish actuarial results of risk segments.
Risk Segment: New Mexico
860
Risk Dimension: State of Residence
861
Bracket for Reporting: April 2001
862
Published Actuarial Index: XYZ Blue
863
853
854
State of Residency
AL AK AZ AR CA CO CT DE DC FL GA HI ID IL IN IA KS KY LA ME MD MA
855
MI MN MS MO MT NE NV NH NJ NM NY NC ND OH OK OR PA RI SC SD TN TX
UT VT VA VI WA WV WI WY
Outside US
856
857
859
NM
Aggregate
Inflows 7,582
Net Amount +289
Outflows 7,293
67 units of account
858
Default
860



Create and trade actuarial instruments. START HERE
901
Select an actuarial index with embedded risk factor populations
902
Select bracketwork of time for reporting actuarial results
903
Select future bracket of time for reporting actuarial results
904
CONTRACT SPECS
Reporting period DONE
905
Select individual, segment, overall populations for such future results
906
CONTRACT SPECS
Actuarial assortment DONE
907
Combine by math operations into a single "bundled" result
908
CONTRACT SPECS
Actuarial bundled result DONE
909
Adjust bundled result via a "wrapper" formula into a package
910
CONTRACT SPECS
Actuarial package DONE
911
Monetize this package into a transferable cash value
912
Actuarial delivery DONE
913
Place this delivery within a financial instrument as needed
914
Actuarial instrument DONE
915
Exchange this instrument with counterparty for agreed price
916
Actuarial trade DONE
917
Report the resulting value of actuarial instrument when known
918
Actuarial report DONE
919
Calculate actuarial instrument against agreed price by netting
920
Settle the netted amount with counterparty
921
ACTUARIAL SETTLEMENT
Actuarial settlement DONE
922

Figure 9a

Figure 9b


ACTUARIAL TRADING SYSTEM - Browser
File
Edit
View
Favorites
Tools
Help
CREATE AND TRADE ACTUARIAL INSTRUMENTS
950
Today's Date: 03Aug2001 Fri
951
Settle the netted amount in cash with counterparty.
952
Trade ID:
Trade #8372
Trade Name:
Forward #3
953
954
955
Trade #8372
Value: 7,000,000 USD
Value Date: 03Aug2001 Fri
956
957
958
Trade Date:
May 5 2001
Counterparty:
ABC Bank
Settlement Terms
Settlement Date:
Aug 1 2001
Settlement:
$7,000,000
Already Settled?:
Yes
Paid to:
Us
Paid from:
ABC Bank
Value
7,000,000.00 USD
959
Value Date
03Aug2001 Fri
After Settlement
ADD
MODIFY
DELETE
SAVE
960
Leg
Calculate Value
961
962
Leg #1
Value: (89,000,000) USD
Value Date: 03Aug2001 Fri
Leg #2
Value: 96,000,000 USD
Value Date: 03Aug2001 Fri
967
We Payout: Forward Price
Direction of Delivery:
We Payout
963
Forward Price of
Multiplier:
1000x
964
We Receive: Actuarial Delivery
968
Direction of Delivery:
We Receive
969
Actuarial Delivery of
Multiplier:
1000x
970
Reporting Period:
Jul 2001
971
Level of Aggregation:
Segment
Segment Risk Population
972
Risk Segment:
Male
973
Risk Dimension:
Gender
974
Public Actuarial Index:
XYZ Blue
975
Number of Units:
4682
Overall Total:
9947
47.07%
976
977
Result Type
978
Inflows
Minus
Outflows
979
Report Date:
Aug 1 2001
980
965
Agreed Upfront Price:
89,000
Total Amount:
(89,000,000)
966
Segment Result:
96,000
981
Actuarial Delivery:
96,000,000
982
983
984
One of Assortment:
No
Combined into Bundle:
No
Wrapped into Package:
Yes

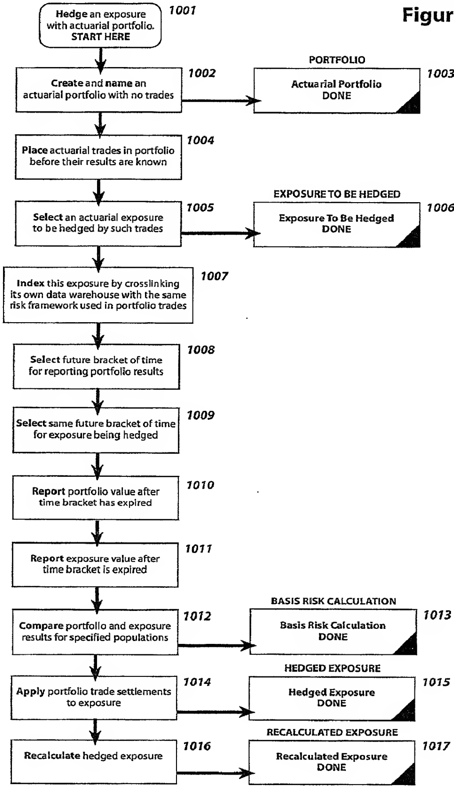

Hedge an exposure with actuarial portfolio. START HERE
1001
Create and name an actuarial portfolio with no trades
1002
PORTFOLIO
Actuarial Portfolio DONE
1003
Place actuarial trades in portfolio before their results are known
1004
Select an actuarial exposure to be hedged by such trades
1005
EXPOSURE TO BE HEDGED
Exposure To Be Hedged DONE
1006
Index this exposure by crosslinking its own data warehouse with the same risk framework used in portfolio trades
1007
Select future bracket of time for reporting portfolio results
1008
Select same future bracket of time for exposure being hedged
1009
Report portfolio value after time bracket has expired
1010
Report exposure value after time bracket is expired
1011
Compare portfolio and exposure results for specified populations
1012
BASIS RISK CALCULATION
Basis Risk Calculation DONE
1013
Apply portfolio trade settlements to exposure
1014
HEDGED EXPOSURE
Hedged Exposure DONE
1015
Recalculate hedged exposure
1016
RECALCULATED EXPOSURE
Recalculated Exposure DONE
1017

Figure 10a

ACTUARIAL TRADING SYSTEM - Browser

Figure 10b

File Edit View Favorites Tools Help

APPLY PORTFOLIO TRADE SETTLEMENTS TO EXPOSURE 1050 Today's Date: 03Aug2001 Fri 1051

Portfolio Name: Forwards Plus 1052 (ADD) (NAME) (MODIFY) (DELETE) (SAVE) Public Actuarial Index: XYZ Blue 1054
Created By: John Major Trade 1053 All Trades Settled?: Yes

Trade Name 1055	Trade ID 1056	Direction of Delivery 1057	Multiplier 1058	Result Type 1059	Risk Segment 1060	From Risk Dimension 1061
Forward #3	Trade #8372	We Receive Delivery of	1000x	Inflows - Outflows	Male	Gender
Joe's Forward Trade	Trade #8373	We Pay Delivery of	2000x	Inflows - Outflows	21, 22, 23	Age
Deal with ABC Bank	Trade #8374	We Pay Delivery of	10,000x	Inflows - Outflows	1-2 Years Ago	Bankruptcy
Tweak of Portfolio	Trade #8375	We Receive Delivery of	500x	Inflows - Outflows	$150k Salary Plus	Income Level

Trade Name *Continued*	Reporting Period 1061	Upfront Agreed Price 1062	Settlement Date 1063	Value of Delivery 1064	Settlement as Hedge 1065	Absolute Value Paid to 1066
Forward #3	Jul 2001	(89,000,000)	August 01 2001	96,000,000	7,000,000	Us from ABC Bank
Joe's Forward Trade	Jul 2001	37,450,000	August 01 2001	(39,000,000)	(1,579,000)	MNO Credit from Us
Deal with ABC Bank	Jul 2001	(25,293,000)	August 01 2001	27,000,000	1,707,000	Us from ABC Bank
Tweak to Portfolio	Jul 2001	(8,000,000)	August 01 2001	8,390,000	390,000	Us from ABC Bank

Trade Name *Continued*	Hedged Exposure 1067	Analog Result 1068	Specific Basis Risk 1069	Specific Basis Risk % 1070	Basis Risk + Hedge 1071
Forward #3	Home Accounts	93,000,000	3,000,000	+3.23%	11,000,000
Joe's Forward Trade	Home Accounts	(39,000,000)	0	0.00%	(1,579,000)
Deal with ABC Bank	Home Accounts	29,000,000	(2,000,000)	-7.41%	(293,000)
Tweak to Portfolio	Home Accounts	7,190,000	1,200,000	+16.78%	1,590,000

Forward Prices: $ (84,843,000) 1072
Public Index Results: 92,390,000 1073
Total of Settlements as Hedge: 7,518,000 1074
Basis Risk: 2,200,000 1075
+2.44%
Hedged Exposure Name: Home Accounts 1076
Same Indexing?: Yes 1077
Analog Results: 90,190,000 1078
Total of Basis Risk + Hedge: 10,718,000 1079